

## GEOGRAPHICAL ASPECTS OF SETTLEMENT OF THE POPULATION ACROSS THE LANDSCAPE SECTORS OF NORTH-EASTERN SLOPE OF THE GREATER CAUCASUS

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**Abstract.** This article studies 3 landscape sectors out of which 2 are main – (Samur-Valvalachay – humid and Atachay-Sumgaitchay – arid) and one is transition (Valvalachay-Atachay – semi-humid) landscape sectors that are formed in submeridional direction with the influence of the climatic, orogenic and hypsometric conditions on the north-eastern slope of the Greater Caucasus. Furthermore the article describes the settlements and the number of their inhabitants, their main occupations, distribution of main sectors of household economies within the divided mountain geosystems sectors of north-eastern slope of Greater Caucasus. The settlements and population distribution dramatically changes with the influence of landscape-ecological conditions which are formed inside the divided sectors. The number of settlements and population share for divided areas are respectively as follows: Samur-Valvalachay – settlements - 397 (75%) and population - 399.544 (79,4%); Valvalachay-Atachay – settlements - 103 (19,5%) and population 89.187 (17,7%); Atachay-Sumgaitchay – settlements - 29 (5.5%) and population 14.731 (2.9%).

**Keywords:** sectoral differentiation, anthropogenic transformation, vertical differentiation of landscape, inter-mountainous depressions, landscape-ecological conditions, settlement

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**Introduction.** The study of vertical distribution patterns of population and settlements based on landscape zones in mountainous countries is one of the pressing topics of modern geography. One of the important aspects of this problem is to identify the settlement patterns in submeridional sectors. The modern landscapes of region under study have characteristics of complex differentiation and formed as a result of interaction and influence of absolute height of relief, lithological substrate of rocks, exposition of mountain slopes, climate and exogenous geomorphological processes. The article investigates the geographical aspects of population settlement and locational patterns of their functional economic activities based on altitude-place differentiation of geocomplexes of North-East slope of Greater Caucasus. [2].

**Research and discussion.** The vertical-spatial differentiation of landscapes of the north-eastern

slope of the Greater Caucasus appears due to the gradual rise of absolute altitude of relief. 3 landscape sectors in submeridional direction in the north-eastern slope of Greater Caucasus have been identified for the first time based on the analysis of ecological and geographical conditions of landscape complexes of area. [5,6]. Two of these landscape sectors considered main sectors (Samur-Valvalachay - humid and Atachay-Sumgaitchay - arid), and one as a transition sector (Valvalachay-Atachay – semi-humid). The ecological and geographical characteristics of sector between Samurchay river and Valvalachay river has experienced the intensive rise in the latest tectonical period compared to the sectors which are located to the south-east of it and the mountainous part of this sector has the maximal rised areas in modern relief of the region (Bazarduzu, 4466 m; Tuphandag, 4193 m; Shahdag, 4243 m; Gizilgaya 3724 m). The population distribution in the north-eastern slope of Greater Caucasus based on the landscpae sectors is given in table 1 below:

**Table 1.**  
**Population distribution in the north-eastern slope of Greater Caucasus based on the landscape sectors**

Landscape sector	Landscape zone	Suitability degree	Climate type	Average annual precipitation		Relative humidity %	Total sum of temperatures over 10°	Of settlements		Population, thousands	
				0-500	500>			0-500	500>	0-500	500>
Samur-valvalachay	Semi-desert, intrazonal forests of plains, forest-steppe, forests of low/mid mountains, sub alp and alpine meadows	more suitable	ET,DWCX, DW''b,Cfb, CBSsa,CS''a	324	981	78-81	3600-3900	397 75.0		399.544 79.4	
								242 45.7	155 29.3	242.071 48.1	157.48 31.3
Valvalachay-atachay	Semi-desert, dry steppe, forests of low/mid mountains, sub alp and alpine meadows	suitable	DWCX, DW''b, CBSsa,CS''a	308	403	76-73	3000-4000	103 19.5		89.187 17.7	
								67 12.7	36 6.8	83.301 16.5	5.886 1.2
Atachay-sumgaitchay	Semi-desert, dry steppe, mid mountain forests, sub alp meadows	less suitable	DW''b, CS''a, CBSsa,	200	430	73	3200-4200	29 5.5		14.731 2.9	
								13 2.5	16 3.0	10.873 2.2	3.858 0.7

**Note:** ET- mountainous tundra climate; Dwcx- cold climate with dry winter; Cs''a – temperate-warm climate with dry summers; Cs''b – temperate-warm climate with dry summers, Cfa – temperate-warm

*climate with equal distribution of precipitation, CBSsa – temperate-warm semi-desert and dry-steppe with dry summers, a – the average temperature of the warmest month is higher than +22 °C; b - the average temperature of the warmest month is higher than +22 °C, the average temperature for 4 months are higher than +10°C; c – the average temperature of the 1<sup>st</sup> month is higher than +10°C; s – more dry summer; w - more dry winter; x – maximum precipitation in the beginning of summer; f – always humid.*

The mountainous section of Samur-Valvalachay sector stands out with the severe climate and synoptic weather conditions and with the number of morpho-climatic zones. The conditions of cloud formation in this sector appears in its maximum extend on the Siyazan fracture line whihc is on the north-eastern slope of Shahdag and these conditions increases towards the mountainous part of sector. The formation of clouds is observed every day in the mornings between 9-10 oclocks in clear weather and then it is getting denser and moving from the synclinal plateau on the nort-eastern slope of the Shahdag towards the south-west – Gusarchay river valley and finally covering the all mountainous area. The modern relief on the north-eastern slope of the Yan range is dominated by the steep and rocky slopes (300-500m) of the river valleys along and across the Siyazan tectonic fault. In the new tectonic era Samur - Valvalachay river sector is charactirized by the deep river valleys in the highest sections. The depth of river valleys in this area is around 1800-1900 m (map 2).

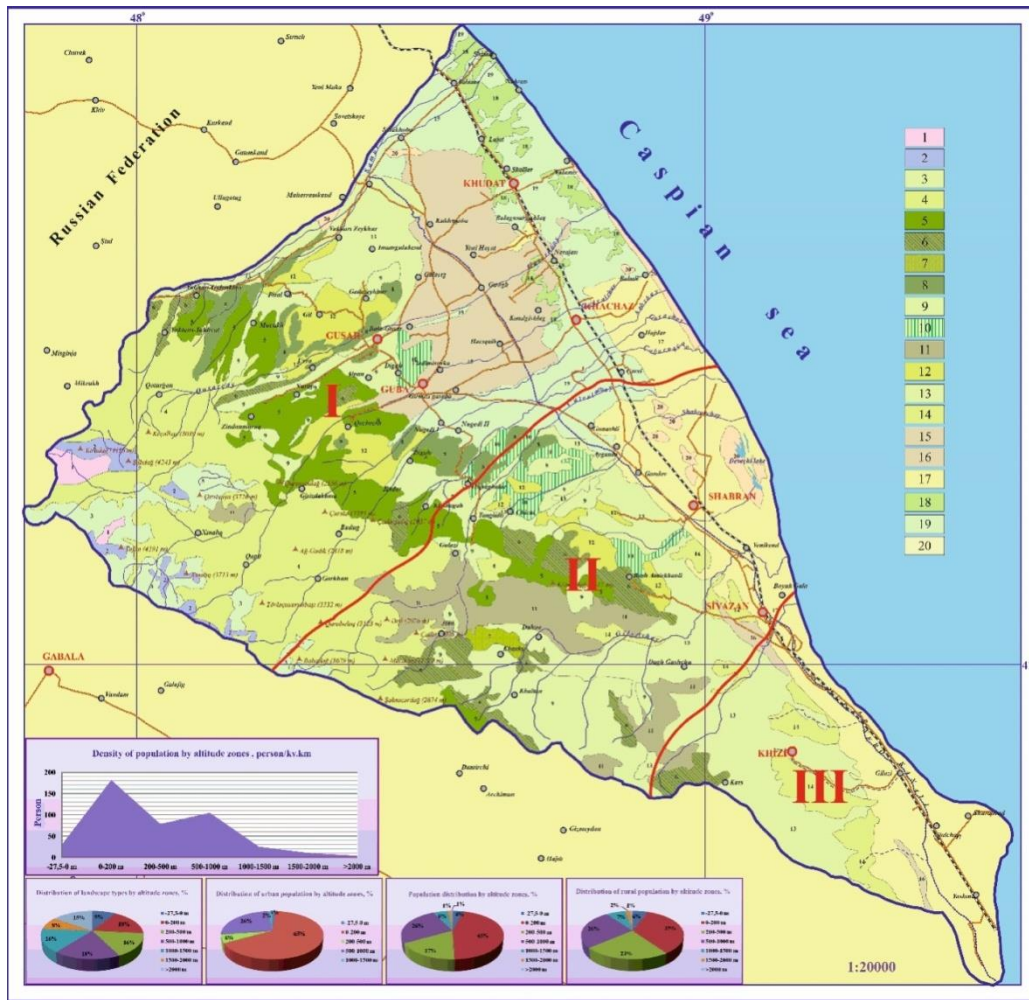


Figure 2. The map illustrating the distribution of population and settlements based on landscape types in the north-eastern slope of Greater Caucasus

**Landscape types:** 1.Nival landscape complex, 2.Subnival landscape complex, 3.Alpine meadows, 4.Subalp meadows, 5.Beech-hornbeam forests of mid mountainous terrain, 6. Oak-hornbeam forests of mid mountainous terrain, 7. Arid forests of arid-denudation areas of mid mountainous terrain, 8. Oak, hornbeam and partially beech forests of low mountains, 9. Bushy meadows of mid mountainous terrain, 10. Forest shrubs of low mountains, 11. Humid steppes of low and mid mountains, 12. xerophyte dry steppes of low and partially mid mountainous terrain, 13. Semi-deserts of arid-denudation low mountains, 14. Dry steppes of the alluvial-proluvial plains, 15.semi-deserts of alluvial, alluvial-proluvial and prolluvial-delluvial plains, 16. Semi-deserts of the abrasion-accumulative plains, 17. Intrazonal deciduous forests of alluvial-proluvial plains, 18. Bushes and forest-shrubs of alluvial-proluvial plains, 19. Swamp-meadow complex of accumulative plains, 20. xerophyte and semi- xerophyte bushy dry steppes of mid mountainous terrain.

The highest part of the Samur – Valvalachay sector is mountainous tectonic area and the mountain rivers such as Samur, Gusarchay and Gudyalchay are formed in this mountainous part and they carry the erosion materials through Samur-Davachi lowland up to Caspian sea and it creates 100m thick cover in Shollar plain [3,5]. This causes changes in lithological and hydrogeological characteristics of the Shollar plain and results in formation of hydromorphic landscapes. Thus, forests in the Shollar plain

widespread as far as sea shores. As a result of favourable lithological conditions the dense forests that once existed in the western – higher mountainous parts of the Shollar plain were under intense anthropogenic influence (80-90%) and transformed into cultivated-seliteb and orchard landscapes. Within the boundaries of this landscape sector, between the Greater Caucasus and its parallel mountains ranges ('Yan silsila) several mountain valleys situated (Shahnabad, Khinalig, Sohub, Yerfi, Gonagkand). Each of these valleys descend from north-west towards the south-east and each of them is 400-500m lower than previous one. They are also separated from each other with chain of hills. The Shahnabad, Khinaliq and Sohub valleys are respectively 2700, 2210, 1600m high. The southern slopes of mountain ridges which are 1400-1500m high separate Sohub (1600m) and Yerfi (1200m) valleys and covered with sub alp meadows which transitions to the wormwood steppes. This transition zone has relatively low precipitation and as a result wormwood steppes are formed. The climate in the Yerfi and Gonagkand valleys becomes arid and the area of steppes increases significantly dividing the forest zone into two sections. The hydromorphic meadows are formed on the left bank of the Valvalachay due to local humidity. V.V. Dokuchayev stated that the transition boundaries of the landscape complexes are not linear – “the nature is not math”. Therefore, the boundary lines of landscape complexes is not linear instead they are curvy. If we continue towards the south-east from this mountain valleys then we reach valleys of Khaltan (800m) and Dahna (400m) which are characterized by more arid landscape complexes [6,7].

The population settled in this landscape sector are engaged in diverse functional types of household activities. The grain growing, horticulture, vegetable growing, gardening, fodder farming and livestock breeding are developed in Shollar plain. To the west from the Samur-Absheron channel the main functional economic activity is gardening.

The gardening areas widespread along the river beds towards the inner parts of low mountains. The main gardening areas along the Samurchay valley are Zukhul village (up to 800 m), along the Gusarchay valley Zindanmurug-Jagar villages (up to 1000-1100 m) and along the Valvalachay valley Gonagkand (up to 1100-1200 m) settlement and in the mountainous regions livestock breeding is widespread.

The landscape sector located between Valvalachay-Atachay has semi-arid climatic characteristics. This sector is transition between Samur-Valvalachay and Atachay-Sumgaitchay sectors. So, landscapes of north-western part of this transition sector are similar to the landscapes of Samur-Valvalachay sector and landscapes of south-eastern part are similar to the Atachay-Sumgaitchay sector. Since the mountains get lower within Valvalachay-Atachay sector and climate becomes arid the semi-

desert landscape complexes of coastal plains increase their area towards the north-eastern edges of low mountainous area. Within this landscape sector landscape complexes both in mountain and plain areas are characterized by more arid features. The mountain forests in the Valvalachay-Atachay sector have arid or semi-arid characteristics. The integrity of mountain forests is disturbed due to the formation of arid landscape complexes in the higher parts of sector such as Gonagkand, Khaltan and Dahna valleys. The forests exist only on the north-eastern slopes of Greater Caucasus ridge and its parallel ridge ('Yan silsila'). Thus, the integrity of mountain forests is disturbed and replaced with the wide sections of dry steppes and only within two indicated areals they keep their development characteristics in better shape.

The landscape sector located to the south-east of Atachay–Sumgaitchay is characterized by more arid climate. Within this sector both plain and mountainous regions have high arid features. The formation of Gilgilchay and Atachay valleys within the Atachay-Sumgaitchay sector causes the inversion of landscapes in mountainous areas, specially in the area of Dubrar mountain and as a result thorny bushes cover large areas creating jungles and mountain steppes. In order to improve functional development of landscape complexes in this sector it would be better to clean meadows from thorny bushes.

In the Samur-Davachi region the climate varies based on the landscape sectors. The average annual temperature is +11,9°C at Shollar station, +12,5°C at Gizilburun (Gilgilchay) station, +13,9°C at Nasosnu station and 13,6°C at Sumgait station. According to this sequence the precipitation decreases. The annual precipitation at Shollar station is 324 mm, at Gizilburun (Gilgilchay) is 308 mm and at Sumgait station it is equal to 200 mm. Analyzing the annual precipitation from these stations it becomes obvious that at Sumgait station it is 120mm less than at Shollar station. The average annual humidity indicators also change from north-west towards the south-east. At Khachmaz station which is in 1<sup>st</sup> section it is 78%, at Gizilburun (Gilgilchay) which is in 2<sup>nd</sup> section it is 76% and finally at Sumgait station it is 73% [2].

With a favorable climatic and geographical location, Samur-Valvalachay sector has a population of 397, with more densely populated areas. 242 of these settlements are located in the Samur-Davachi valley. The total population of the first sector is 399,544. 242,071 people live in 242 settlements in plain areas, and 157,483 people in 155 mountainous areas [1,6,7]. Within this sector, two-thirds of the settlements and populations in the entire study area are concentrated and differ greatly from other sectors with their high density. In recent years, due to the expansion of economic activity of the population, plantations have been extended to the foothills along the Baku-Derbent highway, in the

villages of Vladimirovka and Kuzungishlag, in the area of apple orchards between the villages of Talabigishlag, Shirvanovka and Zukhul villages of Guba district. Different types of the processing industry are functional in the area. Out of total - 103 settlements located in the Valvalachay-Atachay sector, 67 are located in plain area and 36 are in the mountainous areas and 83,301 people live in the plains and foothills of this sector, and 5,886 in the mountainous areas. The majority of these settlements are located in the river valleys and in the uplands (Khaltan, Dahna).

In the plains to the south-east of Valvalachay cattle-breeding is predominant activity due to change of climatic conditions. In the mountainous parts of the area the main economic activities of population are mainly horticulture (apples, pears, cherries, etc.), vegetable gardening (mainly cabbage, potatoes), and to smaller extent cattle-breeding. There is also some horticulture activities in the mid and high mountain areas.

The Atachay-Sumgayitchay sector is characterized by less favorable climatic and geographical conditions, where the climate is very arid. As a result, the number of settlements within the sector and their populations is dropping dramatically. Out of 29 settlements in this sector 13 are located in plains and 16 are in the mountains. 10,873 people live in the plains and 3,858 in the mountains [1]. Within this landscape complex, the seliteb-garden and sowing areas (cabbage, potatoes, corn, etc.) have been developed. Moreover, melons and vegetables are grown in small scales. Inhabitants of the landscape complex are mainly engaged in cattle-breeding and mountain meadows play an important role in this. In spring and early summer, all types of livestock are used as pastures for sheep breeding in the mid-mountainous zone.

In the economic structure of investigated region the development of agriculture has also stimulated the development of various sectors of the processing industry, light and food industries. The main core of the regions agricultural-industrial complex consists of the production of canned fruits and vegetables (Khachmaz, Khudat, Guba, Gusar), fish processing (Khudat), carpet weaving (Guba, Khachmaz, Gusar, Gonaqkand, Pirabadil, Chichi, Khizi, Findigan). Grain and dairy products are processed in Khachmaz, Shabran and Khizi. The livestock breeding sector is mainly represented with the developed milk-meat specialised cattle-breeding and sheep-breeding.

**Conclusion.** It was found that the settlement of population, settlement types and functional types of household economy in the north-eastern slopes of Greater Caucasus depends on vertical zoning of landscapes and the settlement of population decreases from the slopes of mountains to the higher areas. The plain areas, widened river beds, alluvial plains and mountain valleys have dense population and settlements. Based on this aspect the anthropogenic impact in the region also changes. In this parts

the 60% of the natural landscapes had anthropogenic impact and transformed.

According to the above mentioned we can summarize that the distribution of population in this region along the different landscape sectors varies due to specific landscape-ecological conditions that are formed in the region. The number of landscape types starting from the Samur river and towards the south-east are decreasing as a result of changing relief and climatic conditions and this also influences the settlement of population and their numbers within these landscape sectors. Samur-Valvalachay sector has higher level of population due to its favourable landscape-ecological condition. This sector has 75 % (397) of settlements and 79,4% (399.544) of population. Another landscape sector - Valvalachay-Atachay sector which also has favourable landscape-ecological conditions has respectively 103 (19,5%) of settlements and 89.187 (17,7%) of population. The least populated landscape sector - Atachay-Sumgaitchay sector has 29 (5.5%) of settlements and 14.731 (2.9%) of population (mainly settled in mid-mountains area) due its less favourable landscape-ecological conditions.

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